



**CRITICAL HABITAT AREA  
OF GOOSE LAKE,  
ADAMS COUNTY, WISCONSIN**

**DECEMBER 2006**

**Submitted by Reesa Evans  
Adams County Land & Water Conservation Department  
P.O. Box 287, Friendship, WI 53934  
608-339-4268**

## **CRITICAL HABITAT DESIGNATION For Goose Lake, Adams County 2006**

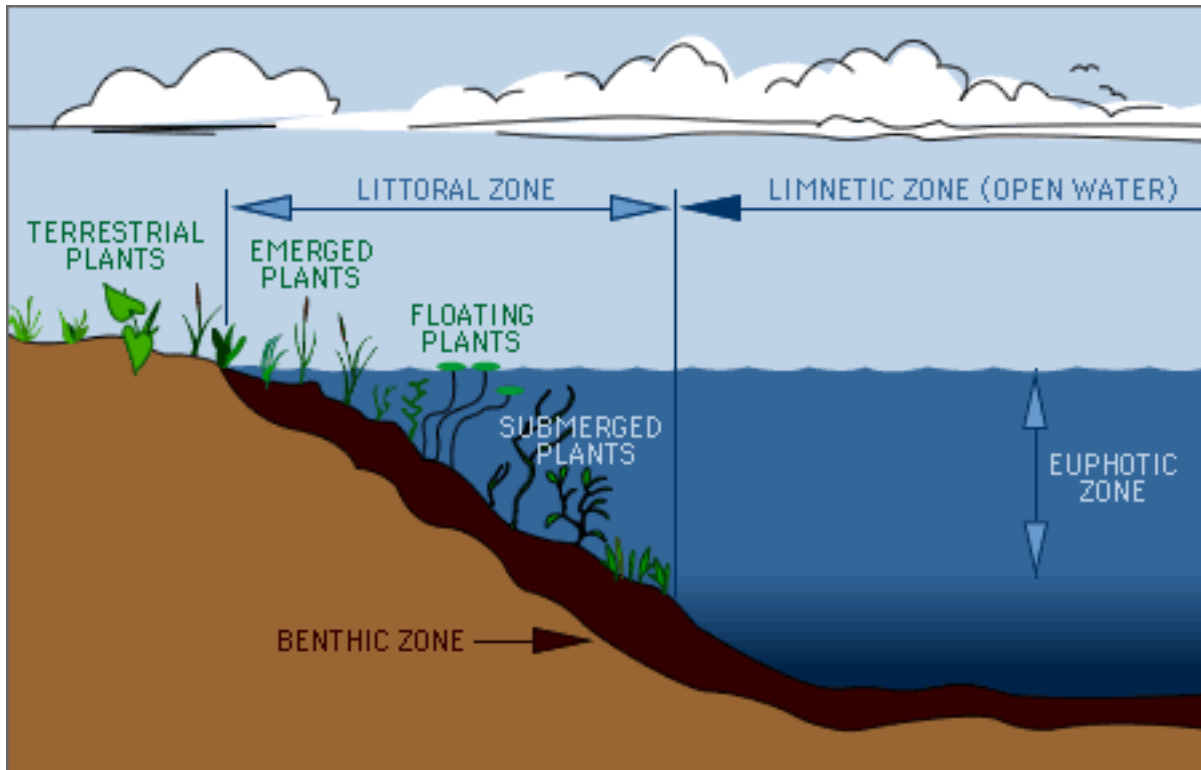
### **INTRODUCTION**

Designation of critical habitat areas within lakes provides a holistic approach for assessing the ecosystem and for protecting those areas in and near a lake that are important for preserving the qualities of the lake. Wisconsin Rule 107.05(3)(i)(I) defines a “critical habitat areas” as: “areas of aquatic vegetation identified by the department as offering critical or unique fish & wildlife habitat or offering water quality or erosion control benefits to the body of water. Thus, these sites are essential to support the wildlife and fish communities. They also provide mechanisms for protecting water quality within the lake, often containing high-quality plant beds. Finally, sensitive areas often can provide the peace, serenity and beauty that draw many people to lakes in the first place.

Protection of critical habitat areas must include protecting the shore area plant community, often by buffers of native vegetation that absorb or filter nutrient & stormwater runoff, prevent shore erosion, maintain water temperature and provide important native habitat. Buffers can serve not only as habitats themselves, but may also provide corridors for species moving along the shore.

Besides protecting the landward shore areas, preserving the littoral (shallow) zone and its plant communities not only provides essential habitat for fish, wildlife, and the invertebrates that feed on them, but also provides further erosion protection and water quality protection.

Critical habitat area designations provide information that can be used in developing a management plan for the lake that protects the lake’s ecosystem by identifying areas in need of special protection. These areas usually contain several types of aquatic plants: emergent; floating-leaf; rooted floating-leaf; and submergent.



Field work for a critical habitat area study was performed on August 14, 2001, on Goose Lake, Adams County. The study team included: Scot Ironside, DNR Fish Biologist; Terence Kafka, DNR Water Regulation; James Keir, DNR Wildlife Biologist; Rhonda Kenyon, DNR Water Regulation & Zoning Specialist; Deborah Konkell, DNR Aquatic Plant Specialist; and Patrick (Buzz) Sorge, DNR Lakes Manager. A follow-up field review was done in summer 2006 by Deb Konkell of the WDNR and Reesa Evans, Adams County Land & Water Conservation Department. Areas were identified visually, with GPS readings and digital photos providing additional information. A followup field review was completed in June 2006 by Deb Konkell of the WDNR and Reesa Evans of the Adams County Land & Water Conservation Department.

Goose Lake is a mesotrophic/oligotrophic seepage lake with good to very good water quality and clarity. It has 81 surface acres, with a maximum depth of 18 feet and an average depth of 7 feet. As in the case in all seepage lakes, the water level on Goose Lake fluctuates naturally with the underground water table. The southwest basin of the lake provides the deepest water habitat. The north and west basins are deep marshes. An island partially separates the west basin and a peninsula partly separates the north basin. Most of the on-lake residences are along the east shore.

## **CRITICAL HABITAT CRITERIA**

All the critical habitat areas on Goose Lake were selected because of their importance for fish and wildlife habitat, importance for protecting water quality, importance of the natural buffer of terrestrial vegetation, and importance of protecting the aquatic plant communities they supported. Each of these sites needs to be preserved in their current natural state and should not be further developed. All of the sites have potential to be used for educational purposes.

### **Common Attributes of All the Critical Habitat Areas**

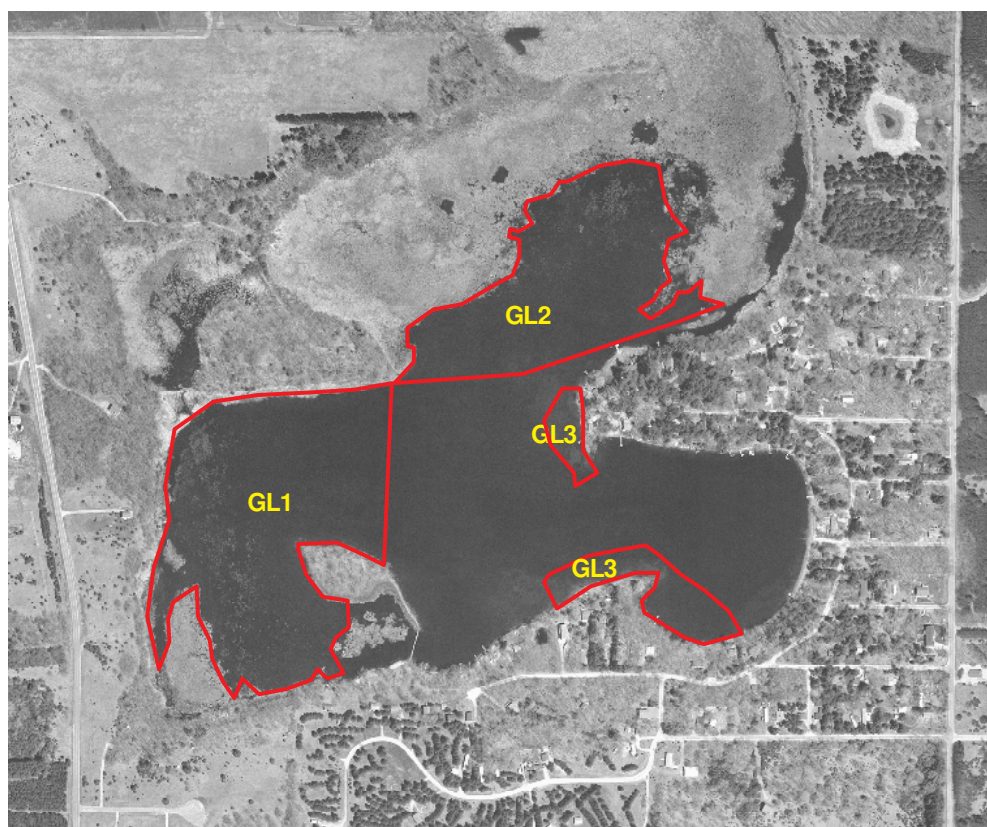
Water Quality: The vegetation at these sites (near and in the water) provides a nutrient buffer that reduces algal growth. Its service as a biological buffer reduces the opportunities for invasions by exotics. The physical buffer the vegetation gives protects against shore erosion and plant fragmentation, as well as stabilizes sediment, thus reducing nutrient recycling and likelihood of algal blooms. Many of these plant areas also provide microhabitat for fish and wildlife, as well as providing conditions that encourage higher biodiversity at the site. In the instance of a seepage lake like Goose Lake, these areas may help protect the quality of the water entering the lake from groundwater seepage or springs.

Fish Habitat: All of these critical habitat areas provide important fish habitat and are the most essential areas in the lake for a healthy fish community. These areas provide space for spawning, nursery sites, feeding sites, and protective cover from predator fish. Eliminating even one of these sites would reduce the amount of fish habitat available, resulting in a reduction of the size and diversity of the fish community that Goose Lake can support.

Wildlife Habitat: Shoreline, emergent and floating-leaf vegetation are primary habitat for many kinds of wildlife. Shore and emergent vegetation are especially important as nesting and brood-rearing areas. This vegetation also provides cover during migrations and provides travel corridors all throughout the year. Floating-leaf vegetation also provides cover. Most of this vegetation is used by various fish and other wildlife for food.

A map of the designated critical habitat areas on Goose Lake is seen on the next page.

## Critical Habitat Areas--Goose Lake



RE:9/06



## **CRITICAL HABITAT AREA GL1—WEST BASIN**

This basin averages 5' in depth and contains near-shore habitat, shoreline habitat and shallow water habitat. The basin provides visual and sound buffers and an area of outstanding beauty for lake residents and visitors.

The shoreline of this basin is mostly undeveloped, although some lots have been occupied since the original 2001 site visit. Most of the shore is wooded or wetland. Woody material is present in the shallow zone for habitat. The wetlands contain wet meadows, shrubs, evergreen wetlands and deep marsh wetlands.

The plant community in this area consists of emergents, floating-leaf rooted plants and submergent plants. Emergent plants include sedges, bulrush, blue-joint grass, marsh fern, spikerush, tag alder, willow, dogwood, and burreed. Emergent species protect the shore from erosion and provide wildlife cover and areas for fish spawning. Floating-leaf rooted plants found were watershield, yellow pond lily, and white water lily. Floating-leaf plants provide cover for fish and invertebrates, as well as assist in damping waves. Submergent species present were small bladderwort, northern milfoil, Eurasian watermilfoil, clasping-leaf pondweed, and flat-stem pondweed. Submergent species provide many fish and wildlife benefits (see table 1). Purple Loosestrife was also present. Aquatic species found in 2006 included Swamp Milkweed, Watershield, Bottlebrush Sedge, Eurasian Watermilfoil, Southern Naiad, Variegated Yellow Pond Lily, White Water Lily, Reed Canarygrass, Illinois pondweed, Flat-Stem Pondweed, Water Bulrush, Soft-Stem Bulrush, cattails, and 4 types of Bladderwort.



**Table 1: Aquatic Plant Benefits**

	<u>Fish</u>	<u>Water</u>	<u>Shore</u>	<u>Upland</u>	<u>Muskrat</u>	<u>Beaver</u>	<u>Deer</u>
		<u>Fowl</u>	<u>Birds</u>	<u>Birds</u>			
<i>Brasenia schreberi</i>	I,C,S	F,I,C	-	-			
<i>Carex spp</i>		F	F,I	-			
<i>Eleocharis spp</i>	F,I,C,S	F,I,C	F,C	F,C	F	F	
<i>Juncus spp</i>	F,I,C,S	F,I,C	F,C				
<i>Myriophyllum spp</i>	F,I,C,S	F,I	F		F		
<i>Najas spp</i>	F,C,I	F	F	F	F		
<i>Nuphar variegataa</i>	F,I,C,S	F	F		F	F	F
<i>Nymphaea odoratoa</i>	F,I,C,S	F	F		F	F	
<i>Potamogeton spp</i>	F,I,C,S	F,I	F		F	F	F
<i>Scirpus spp</i>	F,C,I	F,C	F,C,N	F	F	F	F
<i>Utricularia spp</i>	F,I,C,S						

F = Food; I = Shelters Invertebrates; C = Cover; S = Spawning; N = Nesting



**View of GL1—West Side**



Maintaining the integrity of this area is important to protect the water quality of Goose Lake. The submerged and floating-leaf vegetation take up nutrients into their tissues that would otherwise be available for algae growth or overly-dense plant growth. The emergent vegetation on the west shore filters water that runs off the steep west shore. The submergent vegetation is protecting the lake bottom from resuspension of the fertile muck and peat sediments by boat traffic and wind action, thus maintaining clarity.

The fallen woody debris along the shore and mosaic of submerged vegetation and floating-leaf vegetation with an open area provides a diversity of habitat and feeding opportunities for the fish community. This basin provides spawning, nursery, feeding and cover for northern pike, large-mouth bass, perch, panfish, suckers and bullheads.

The variety of emergent vegetation, floating-leaf vegetation, shrubs and snag trees provide cover and feeding areas for upland wildlife; shelter, cover,



nursery and feeding areas for beaver, otter, muskrat & mink; cover, nesting & feeding for raptors, ducks, songbirds and geese; cover, feeding & nesting for amphibians and reptiles.

The healthy aquatic plant community may be preventing the dominance of Eurasian Watermilfoil.

### **Recommendations for GL1:**

- (1) Maintain current habitat for fish and wildlife.
- (2) Do not remove fallen trees along the shoreline.
- (3) No alteration of littoral zone unless to improve spawning habitat.
- (4) Seasonal protection of spawning habitat.
- (5) Maintain snag/cavity trees for nesting.
- (6) Leave nest boxes.
- (7) Maintain or increase wildlife corridor.
- (8) Make area no-wake zone.
- (9) Protect emergent vegetation.
- (10) No aquatic plant and shore plant removal.
- (11) Use forestry best management practices on shore.
- (12) No use of lawn products on shore.
- (14) No bank grading or grading of adjacent land.
- (15) No pier placement, boat landings, development or other shoreline disturbance in the shore area of the wetland corridor.
- (16) No pier construction or other activity except by permit using a case-by-case evaluation.
- (17) No installation of pea gravel or sand blankets.
- (18) No bank restoration unless the erosion index scores moderate or high.
- (19) If the erosion index does score moderate or high, bank restoration only using biologs or similar bioengineering, with no use of riprap or retaining walls.
- (20) Placement of swimming rafts or other recreational floating devices only by permit.
- (21) Maintain buffer of shoreline vegetation.
- (22) Maintain aquatic vegetation buffer in undisturbed condition for wildlife habitat, fish use and water quality protection.
- (23) Post Eurasian Watermilfoil signs at the boat landing.

(24) Monitor the EWM and take actions if it starts to dominate the aquatic plant community using spot-treatment chemicals only, specific for exotic species.

(25) Treat the purple loosestrife using spot-treatment chemicals only, specific for exotic species, or biological controls.

## **CRITICAL HABITAT AREA GL2—NORTH BASIN**

This area averages 6.5' in depth and contains near shore habitat, shoreline habitat and shallow water habitat. The basin provides visual and sound buffers and an area of outstanding beauty for lake residents and visitors.

The shoreline of this basin is mostly undeveloped, although some lots have been occupied since the original 2001 site visit. Most of the shore is wooded or wetland. Woody material is present in the shallow zone for habitat. The wetlands contain wet meadows, shrubs wetlands, tamarack bogs, and deep marsh wetlands.

The plant community in this area consists of emergents, floating-leaf plants and submergents. Emergents include: sedges, dogwood, water bulrush, marsh fern, tag alder, tamarack, cattail, and bulrush. Emergent vegetation protects shores from erosion and provides fish & invertebrate cover, as well as fish spawning areas. Floating leaf vegetation present were watershield, water smartweed, yellow pond lily, and white water lily. Such vegetation dampens wave action to protect shores and also provides cover for fish and invertebrates.

Submergent species found in 2001 included small bladderwort, Eurasian watermilfoil, bushy pondweed, floating-leaf pondweed, clasping-leaf pondweed, and flat-stem pondweed. These species provide many fish and wildlife benefits (see Table 2). Filamentous algae were also present.

In 2006, a species of special concern, *Eleocharis robbinsii* (Robbin's Spikerush), was also found in this area. Several other high-quality aquatic species, including *Cephalanthus occidentalis* (Buttonbush), *Cladium mariscoides* (Twig Rush), *Lysmachia quadriflor* (4-Flower Yellow Loosestrife) and *Sarracenia purpurea* (Purple Pitcher Plant)—were also found in this area. Other aquatic species found in 2006 included

Watershield, Bottlebrush Sedge, Crawford's Sedge, Eurasian Watermilfoil, Southern Naiad, Variegated Yellow Pond Lily, White Water Lily, Reed Canarygrass, Water Smartweed, Illinois pondweed, Marsh Cinquefoil, Water Bulrush, Soft-Stem Bulrush, Marsh Fern, cattails, and 4 types of Bladderwort.

**Table 2: Aquatic Plant Benefits**

	<b>Fish</b>	<b>Water</b>	<b>Shore</b>	<b>Upland</b>	<b>Muskrat</b>	<b>Beaver</b>	<b>Deer</b>
		<b>Fowl</b>	<b>Birds</b>	<b>Birds</b>			
<i>Brasenia schreberi</i>	I,C,S	F,I,C	-	-			
<i>Carex spp</i>		F	F,I	-			
<i>Ceratophyllum demersum</i>	F,I,C,S	F,I,C			F		
<i>Chara</i>	F,S	F,I,C					
<i>Eleocharis spp</i>	F,I,C,S	F,I,C	F,C	F,C	F	F	
<i>Juncus spp</i>	F,I,C,S	F,I,C	F,C				
<i>Myriophyllum spp</i>	F,I,C,S	F,I	F		F		
<i>Najas spp</i>	F,C,I	F	F	F	F		
<i>Nuphar variegataa</i>	F,I,C,S	F	F		F	F	F
<i>Nymphaea odoratoa</i>	F,I,C,S	F	F		F	F	
<i>Phalaris arundinacea</i>		C					
<i>Polygonum amphibium</i>	C,I	F,I	F,I	F,I	F		F
<i>Potamogeton spp</i>	F,I,C,S	F,I	F		F	F	F
<i>Potentilla palustris</i>	C,I	F,I	F,I				
<i>Sagittaria spp</i>	C,I	F,C,I	F,C,I	F,C,I	F	FF	
<i>Scirpus spp</i>	F,C,I	F,C	F,C,N	F	F	F	F
<i>Typha spp</i>	I,C,S	F	F,C,N		F,C,N	F	
<i>Utricularia spp</i>	F,I,C,S						

F = Food; I = Shelters Invertebrates; C = Cover; S = Spawning; N = Nesting

Maintaining the integrity of this area is important to protect the water quality of Goose Lake. The submerged and floating-leaf vegetation take up nutrients into their tissues that would otherwise be available for algae growth or overly-dense plant growth. The emergent vegetation on the west shore filters water that runs off the steep west shore. The submergent vegetation is protecting the lake bottom from resuspension of the fertile muck and peat sediments by boat traffic and wind action, thus maintaining clarity.



**Looking to GL2 from GL1 area**



**Close-Up of West Side of GL2**



Southwest side of GL2



Northwest Area of GL2







The emergent vegetation and mosaic of submerged vegetation and floating-leaf vegetation with an open area provides a diversity of habitat and feeding opportunities for the fish community. This basin provides spawning, nursery, feeding and cover for northern pike, large-mouth bass, perch, panfish, suckers and bullheads.

The variety of emergent vegetation, floating-leaf vegetation, shrubs and snag trees provide cover and feeding areas for upland wildlife; shelter, cover, nursery and feeding areas for beaver, otter, muskrat & mink; cover, nesting & feeding for raptors, ducks, songbirds and geese; cover, feeding & nesting for amphibians and reptiles.

The healthy aquatic plant community may be preventing the dominance of Eurasian Watermilfoil.

### **Recommendations for GL2:**

- (1) Maintain current habitat for fish and wildlife.
- (2) Do not remove fallen trees along the shoreline.

- (3) No alteration of littoral zone unless to improve spawning habitat.
- (4) Seasonal protection of spawning habitat.
- (5) Maintain snag/cavity trees for nesting/
- (6) Install nest boxes.
- (7) Maintain or increase wildlife corridor.
- (8) Make no-wake zone.
- (9) Protect emergent vegetation, especially those with high Coefficients of Conservatism.
- (10) No aquatic plant and shore plant removal. Leave as much vegetation as possible to protect water quality and habitat.
- (11) Use forestry best management practices on nearby terrestrial areas.
- (12) If possible, limit development of this area for housing or similar recreational use to preserve the wetlands.
- (13) No use of lawn products on nearby land.
- (14) No bank grading or grading of adjacent land.
- (15) No pier placement, boat landings, development or other shoreline disturbance in the shore area of the wetland corridor.
- (16) No pier construction or other activity except by permit using a case-by-case evaluation.
- (17) No installation of pea gravel or sand blankets.
- (18) No bank restoration unless the erosion index scores moderate or high.
- (19) If the erosion index does score moderate or high, bank restoration only using biologs or similar bioengineering, with no use of riprap or retaining walls.
- (20) No placement of swimming rafts or other recreational floating devices.
- (21) Maintain buffer of shoreline vegetation.
- (22) Maintain aquatic vegetation buffer in undisturbed condition for wildlife habitat, fish use and water quality protection.
- (23) Post Eurasian Watermilfoil signs at the boat landing.
- (24) Monitor the EWM and take actions if it starts to dominate the aquatic plant community using spot-treatment chemicals only, specific for exotic species.

### **CRITICAL HABITAT AREA GL3**

This area is being added after a field review in 2006 by WDNR and Adams County Land & Water Conservation Department staff. It serves as a nutrient buffer zone, as well as a physical and biological buffer. Although there are houses in this area, most of them are set back substantially from the ordinary high water mark, up the slopes. There are dense beds of plants that provide micro-habitat and sediment stabilization. The area contains near shore habitat, shoreline habitat and shallow water habitat.

The area comprises about 1000' of shoreline with an average water depth of 4'. It is located to the west and south of the public boat ramp on Goose Lake. Sediments found include marl, peat, sand and silt, or mixtures thereof. Vegetation just landward of shore includes mostly native forbs and shrubs, with a small area of traditional lawn and some presence of woody cover.

Northern pike is sometimes found in the area, as well as largemouth bass, suckers and an assortment of panfish. Wildlife including songbirds, geese, amphibians and reptiles are known in Area GL3.

An emergent species of special concern, *Eleocharis robbinsii*, was abundant in this area. Other emergent vegetative species found in 2006 included Marsh Fern, Arrowhead, and 3-Square Bulrush. Emergent species like these protect the shore from erosion and provide fish and wildlife cover, as well as areas for fish spawning. Floating-leaf vegetation was also found in this area: Variegated Yellow Water Lily, White Water Lily, Watershield, and Water Smartweed. Floating-leaf vegetation dampens wave actions and provides cover for fish, invertebrates and wildlife.

Submergent vegetation was also present here. Submergent vegetation provides many fish and wildlife benefits (see Table 3). Submergents at GL3 included Waterweed, Eurasian Watermilfoil, Northern Milfoil, Southern Naiad, Bushy Pondweed, Sago Pondweed, White-Stem Pondweed, Clasp-Leaf Pondweed, Illinois Pondweed, and 2 types of bladderwort.



**Table 3: Aquatic Plant Benefits**

	<u>Fish</u>	<u>Water</u>	<u>Shore</u>	<u>Upland</u>	<u>Muskrat</u>	<u>Beaver</u>	<u>Deer</u>
		<u>Fowl</u>	<u>Birds</u>	<u>Birds</u>			
<i>Brasenia schreberi</i>	I,C,S	F,I,C	-	-			
<i>Carex spp</i>		F	F,I	-			
<i>Chara</i>	F,S	F,I,C					
<i>Eleocharis spp</i>	F,I,C,S	F,I,C	F,C	F,C	F	F	
<i>Juncus spp</i>	F,I,C,S	F,I,C	F,C				
<i>Myriophyllum spp</i>	F,I,C,S	F,I	F		F		
<i>Najas spp</i>	F,C,I	F	F	F	F		
<i>Nuphar variegataa</i>	F,I,C,S	F	F		F	F	F
<i>Nymphaea odoratoa</i>	F,I,C,S	F	F		F	F	
<i>Polygonum amphibium</i>	C,I	F,I	F,I	F,I	F		F
<i>Potamogeton spp</i>	F,I,C,S	F,I	F		F	F	F
<i>Potentilla palustris</i>	C,I	F,I	F,I				
<i>Sagittaria spp</i>	C,I	F,C,I	F,C,I	F,C,I	F	FF	
<i>Scirpus spp</i>	F,C,I	F,C	F,C,N	F	F	F	F
<i>Typha spp</i>	I,C,S	F	F,C,N		F,C,N	F	
<i>Utricularia spp</i>	F,I,C,S						

F = Food; I = Shelters Invertebrates; C = Cover; S = Spawning; N = Nesting



**Photo showing GL3 and House Setback**



**Close-Up of Near Shore Area  
Showing Emergents & Shrubs**





**Another Near-Shore & Shore Area in GL3**



**Point Area in GL3**

### **Recommendations for GL3:**

- (1) Maintain current habitat for fish and wildlife.
- (2) Do not remove fallen trees along the shoreline or from the water.
- (3) No alteration of littoral zone unless to improve spawning habitat.
- (4) Seasonal protection of spawning habitat.
- (5) Maintain snag/cavity trees for nesting.
- (6) Install nest boxes.
- (7) Maintain or increase wildlife corridor.
- (8) Make no-wake zone.
- (9) Protect emergent vegetation, especially those with high Coefficients of Conservatism.
- (10) Minimize aquatic plant and shore plant removal to maximum 30' wide viewing/access corridor. Leave as much vegetation as possible to protect water quality and habitat.
- (11) Use forestry best management practices on shore.
- (12) If possible, limit development of this area for housing or similar recreational use while maintaining setbacks and current buffers.
- (13) No use of lawn products on shore.
- (14) No bank grading or grading of adjacent land.
- (15) No pier placement, boat landings, development or other shoreline disturbance in the shore area of the wetland corridor.
- (16) No pier construction or other activity except by permit using a case-by-case evaluation.
- (17) No installation of pea gravel or sand blankets.
- (18) No bank restoration unless the erosion index scores moderate or high. Include stormwater runoff management in all shoreline protection designs.
- (19) If the erosion index does score moderate or high, bank restoration only using biologs or similar bioengineering, with no use of riprap or retaining walls.
- (20) Placement of swimming rafts or other recreational floating devices only by permit.
- (21) Maintain buffer of shoreline vegetation.
- (22) Maintain aquatic vegetation buffer in undisturbed condition for wildlife habitat, fish use and water quality protection.
- (23) Post Eurasian Watermilfoil signs at the boat landing.
- (24) Monitor the EWM and take actions if it starts to dominate the aquatic plant community using spot-treatment chemicals only, specific for exotic species.